

REMARKS

Claims 1-6, 9, 10, 26-29, and 34-40 are present in this application. Claims 39 and 40 have been added. Claims 5, 6, 9, and 36-38 have been withdrawn as a result of a restriction requirement.

Claims 1 and 26 are independent claims.

Claim Objection

Claims 1 and 26 have been objected to for a minor grammatical error. Applicants have amended claims 1 and 26 in order to address the claim objection. Applicants request that the objection be reconsidered and withdrawn based on the claims as amended.

35 USC 103(a) – Wong

Claims 1, 10, and 34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Application Publication 2004/0002225 (Wong). Applicants respectfully traverse this rejection.

CLAIM 1

Claim 1 is directed to a TFT array substrate (e.g., TFT array substrate 121, as shown in Figs. 39(a) and 39(b)), comprising:

a thin film transistor section (e.g. TFT section 22) in which a gate electrode (e.g. gate electrode 13) is formed on a substrate (e.g. glass substrate 12), and in which a semiconductor layer (e.g. semiconductor layer 16) is formed by etching a semiconductor film (Fig. 5, α -Si layer 64 and n⁺ layer 65) after a mask material (e.g., resist layer 67, or conductor layer 123 as in Fig. 41) is dropped onto the semiconductor film and is formed on the gate electrode separated by a gate insulation layer,

the formed semiconductor layer having dimensions along a periphery defined as a result of being formed by dropping a single droplet of the mask material (specification at paragraph bridging pages 35 to 36; page 84, second paragraph).

Wong does not teach semiconductor layer 732 resulting from dropping droplets of mask material

The Office Action alleges that Wong teaches the claimed feature of the semiconductor layer (732) having dimensions along a periphery defined as a result of being formed by dropping droplets of the mask material. (Office Action at page 3). Applicants disagree.

Wong discloses that semiconductor layer (732) is formed by depositing an etch mask 740. Fig. 7(d; not labeled) of Wong shows layer 732 after being etched based on a etch mask 740 previously formed (Fig. 7(c)).

Forming of semiconductor layer (732) is described with respect to steps 628, 632, 636, and 640 of Fig. 6, at paras. 0048 and 0049 of Wong. In paragraph 0049, Wong discloses that an island structure is formed by depositing an etch mask 740 over a top dielectric layer, then etching the dielectric and semiconductor stack. The printed pattern is then removed to define the island features.

However, Wong does not disclose that etch mask 740 is formed by applying droplets, which the Examiner has assumed.

To the contrary, Wong discloses use of droplets with respect to forming of “fine features.” In particular, Wong is directed to forming fine features (i.e., features having width that is less than 50 micrometers, as defined in para. 0032) at the spaces between patterns that have been formed by droplets. For example, as can be seen in Fig. 7, electrode 724 is formed at space 716 between patterns 712 in Fig. 7(a) after the patterns are removed.

Applicants submit that Wong does not disclose semiconductor layer (732) having dimensions along a periphery defined as a result of being formed by dropping droplets of the mask material, e.g., 740.

For at least this reason, Applicants submit that Wong fails to disclose at least the claimed feature of “the formed semiconductor layer having dimensions along a periphery defined as a result of being formed by dropping a single droplet of the mask material.”

Wong teaches away from using a single droplet

Furthermore, the Office Action admits that Wong fails to disclose dropping a single droplet of the mask material, but instead alleges that the claimed feature is a product by process limitation in which it does not matter how a product is made. The Office Action also alleges that Wong discloses that the size of droplets can be adjusted depending on the desired size of features. (Office Action at top of page 4).

To the contrary, Applicants submit that Wong particularly teaches away from using a single droplet of mask material. In particular, Applicant submits that Wong teaches away from determining feature size based on droplet size.

Wong explicitly teaches that controlling feature sizes of printed liquid masks is difficult due to spreading of the liquid on the surface (para. 0003), and that small sizes of features are difficult to reach due to limitations on the size of the smallest droplet (para. 0004). Subsequently, Wong discloses an approach in which feature size will not be limited by droplet size, but instead how closely droplets can be positioned together without combining to form a single droplet (para. 0019). In other words, Wong teaches forming fine features at the spaces between patterns formed by droplets.

Thus, Applicants submit that Wong specifically teaches away from using droplets as a mask for “fine features,” (see paras. 0019 and 0046) and as admitted in the Office Action does not teach a semiconductor layer 732 having dimensions which are formed by a single droplet.

Express criticality of claimed invention

In addition, the Office Action expresses that the Applicant has not disclosed any criticality obtained from using a single droplet of mask material rather than multiple droplets taught by Wong.

According to the present specification, it is preferred that a resist layer be formed by a single droplet. If the resist layer were to be formed by a plurality of drops, forming of the semiconductor layer would take a long time, and the life of the ink jet head is shortened

(specification at page 36, paragraph at lines 8-15). Thus, Applicants submit that a criticality of forming the semiconductor layer of a single droplet is to reduce the amount of time taken to manufacture the semiconductor layer and to extend the life of the ink jet head.

In addition, unlike Wong which seeks forming “fine features,” the present invention sizes a layer to allow for tolerances in forming the layer with ink jet printing (see Fig. 37).

For at least these reasons, Applicants submit that the rejection fails to establish *prima facie* obviousness and must be withdrawn.

35 USC 103(a) – Wong, Kasahara

Claims 2-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Wong in view of U.S. 6,822,701 (Kasahara). Applicants submit that claims 2-4 being dependent claims are patentable at least for the reasons above for claim 1.

35 USC 103(a) – Yi, Wong

Claims 26-29 and 35 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,909,477 (Yi) in view of Wong. Applicants respectfully traverse this rejection.

The Office Action relies on Yi for teaching a conductor layer 38 formed in contact with a semiconductor layer 36. The Office Action admits that Yi fails to teach the conductor layer being formed by dropping a droplet. The Office Action instead relies on Wong for making up for this deficiency. For reasons similar to the above for claim 1, Applicants disagree that Wong makes up for the deficiency in Yi.

Applicant submits that in addition to the differences over Wong as in claim 1, neither Wong nor Yi disclose a final end product in which each of the conductor layer and semiconductor layer take on a shape resulting from having been formed by dropping a droplet.

For at least these additional reasons, Applicants submit that Yi and Wong fail to disclose at least the claimed feature of “the conductor layer is formed in contact with the semiconductor layer and one of source and drain electrodes of the thin film transistor section, and has a portion formed by dropping a droplet, the conductor layer and the semiconductor layer having substantially the same dimensions along the respective periphery as a result of being formed by dropping a droplet,” as well as that Wong specifically teaches away from a semiconductor layer formed based on dropping a single droplet.

For at least these reasons, Applicants submit that the rejection fails to establish *prima facie* obviousness and must be withdrawn.

New Claims

Claims 39 and 40 have been added as claims dependent from claim 1. For at least the reasons above for claim 1, Applicants submit that claims 39 and 40 are patentable as well.

Claim 39 is supported by the specification as filed at page 81, lines 13 to 17.

Claim 40 is supported by the specification as filed at page 84, lines 16 to 18.

Applicants submit that no new matter has been added by these new claims.

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CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact **Robert Downs** Reg. No. 48,222 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Application No. 10/526,009
Amendment dated December 23, 2009
Reply to Office Action of October 2, 2009

Docket No.: 1248-0772PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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